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ABSTRACT

This study is part of an ongoing research project examining women in Sweden who work in traditional female professions. The project aims to investigate women's life patterns in a longitudinal perspective--targeting individuals born in 1948 and covering the years 1961 to 1981/82--with focus on their background, education and work experiences. Researchers concentrated on three professional groups: lower primary teachers, nurses, and secretaries. Investigators used multiple discriminant analysis in two separate analyses, dividing the data set between information collected when the respondents were 13 and when they were 32 respectively. Findings suggest that analyses could distinguish significantly between the three groups of women. The discriminant power was considerably stronger when analyzing the women as young adults. The subject's general ability in school served as the most important predictor. Two of the interest orientations, verbal and office oriented activities, also proved to be strong predictors. Likewise, the home background and the level of the mother's education influenced predictors. Some patterns could be traced back to when the subjects were 13 years old. Teachers showed the most distinctive profile, being the ones well-adapted to school. The common trait in all three professions was the tendency towards service work. The researchers caution that questioning data which were originally designed for other purposes will cause some information to be lacking. Appendixes contain study data. Contains 11 references. (RJM)

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A Longitudinal Analysis of Three Traditional Female Professions

Eva Wirén

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Acknowledgements

This report is a revised version of a paper presented at the AERA annual meeting in New Orleans, 4-8 April, 1994.

The study relates to a research project about women working in traditional female professions, the LING-K-project (Long-enduring effects of schooling and women's life patterns).

Scientific leader and supervisor in the project is Professor Berit Askling. Support for the project was provided by the Bank of Sweden Tercentenary Foundation.

Introduction

This study is part of an ongoing research project about women working in traditional female professions.[1] The project, and also this study, uses data in a Swedish national longitudinal data bank which consists of information from a representative sample of individuals born in 1948. The basic aim of the project is to investigate women's life patterns in a longitudinal perspective with focus on their background, education and work experiences as related to existing conditions on societal level.

During the postwar period in Sweden women's participation on the labour market increased rapidly. The fact that many married women with children started to work led to different kinds of political demands such as different reforms in economic, social and family policies, contributing to the increase of the amount of women on the labour market. In 1988 about 85 percent of the women (between ages 20 - 64 years) were working outside the home (compared to 90 percent of the men) (Jönsson, 1992).

The increase of women on the labour market was especially significant from the 1970s which relates to the growth and expansion of the public sector that occurred in Sweden in the 1960s. Different fields of activities then expanded such as daycare, school, medical and social health-care system. The demands from the labour market also brought about an expansion in the dimension of related occupational educations, as for instance teacher education and nursing education. As a result of the demand from the labour market and the good opportunities for getting work (and education) within these areas, many of the women that entered the labour market in the 1970s then entered into typical female professions. Also influencing this development was the popularity among girls at that time to choose these types of education and occupations (Askling & Wirén, 1992).

Looking at the labour market in Sweden today it is still to such a high degree divided by gender, that it is quite logical to talk of two different labour markets, one for men and one for women. Women dominate in the educational sectors, social service and nursing. Men

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1 LING-K-project (Long-enduring effects of schooling and women's life patterns).

dominate in the technical and practical branches. At the upper levels of the educational system (which on the whole mirrors the structure of the labour market) females are found in the parts preparing for teaching, nursing, social work and in arts and behavioral sciences. Males, on the other hand, are dominating the technical and economic sectors of the educational system (Wernersson, 1989).

Given the very clear-cut picture of the divided labour market it is tempting to view women working in the public sector and/or within traditional female professions as one homogeneous group, to be compared either with men or with women working in male-dominated professions. The present study aims to go one step further and explore differences and similarities within the female part of the labour market, more specifically, among women working in traditional female professions. The groups chosen for this study are nurses, lower primary teachers and secretaries.

The main question posed is to what degree it is possible to distinguish between women in these three professions when taking into consideration various individual characteristics. Put somewhat differently, the question relates to the degree to which it can be said that these groups are forming specific professional profiles as opposed to a common female oriented profile. The data used are of longitudinal character and therefore enable us to put forward the next question; to what degree professional profiles can be found before the women entered the occupation, i.e., when they were young adolescents, and, to what degree professional profiles are related to their adult age, i.e., after entering the profession. The third question posed then is how these profiles look, i.e., in what areas these women differ.

An extensive amount of research has been conducted as to what factors influence individuals' choices and attainments of education and occupation. Previous research has, among other things, shown the importance of including information about mothers' education and occupational status when analysing women's choice of career and education. Härnqvist (1989) showed, using the same longitudinal data as in this study, that there was a direct link between mothers' work outside the home and number of children in the family on one hand and the educational level attained among females on the other hand, while no such direct link was found for males. Reeves and Szafran (1988) found that mothers' work outside the home was an influential factor when comparing women in non-

traditional versus traditional occupations, but not when comparing men in the similar categorization of occupational status. Lemkau (1983) also show that women in non-traditional occupations are significantly more likely to be the first child and to have a mother working outside the home compared to women in traditional occupations. Not only that the mother works outside the home but also to what type of occupation she has are factors related to the occupational destination of the daughters (Rosenfeld, 1978, Pearson, 1983).

In a Canadian study which analyzed what influenced grade 12 students' science - nonscience choices of occupational careers, it was shown that family influence variables were more important for females' choice of science-career while for males it was more important with interests and motivations in the subject (Lewko, Hein, Garg and Tesson, 1993). Looking at the relations between value orientations and vocational choice among adolescent women, it was found that females aspiring to traditional occupations scored higher on values like being forgiving, helpful and obedient. Females aspiring to innovative occupations in contrast scored higher on values like being courageous, imaginative and independent (Young, 1984).

The research studies referred to have all been comparing different groups in regard either to gender or to classifying women in traditional and nontraditional occupations. In this study we have explored differences between different occupational groups of women but restricted to the same category: female traditional occupations.

Data, Variables, Subjects and Statistical Methods

Data and Variables

The analyses and results in this study are based on a national longitudinal database in Sweden comprising a representative sample of individuals born in 1948 and covering a time-span of about 20 years dating from 1961 to 1981/82.[2]

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2 The database was built up under the supervision of Professor Kjell Härnqvist at the Department of Education, Gothenburg University, Sweden.

When the initial collection of data began in 1961 the sample consisted of about one tenth of the age cohort, around 12,000 individuals. At that time the respondents were 13 years old and normally in grade 6 of the compulsory school. Information was collected related to school success, such as school marks in different subjects, results on national achievement tests as well as results on three ability tests specially designed in the project. Additional information mainly regarding the students home background, attitudes and interest in schoolwork, interest orientations and leisure activities was also collected.

In 1980 a follow-up study was conducted by means of mail questionnaires where information was collected from a total sub-sample of about 6,300 individuals, at that time 32 years old.[3] The information relates to different areas in the respondent's lives as young adults; education, professional status and work experience, social life, different kinds of skills and competence (self-rated) and leisure time activities and engagements.

In the present study information relating both to the data collected in 1961, when the respondents were 13 years old, and to the data from 1980, when they were 32 years old, is used.

From the respondents' time as teenagers, i.e., in 1961, three groups of variables are included;

background variables: home background, mother's educational level, if the mother is working outside the home, number of siblings and the position among siblings

school variables: general level of ability, numerical and verbal ability, educational ambition (including parental support), adaptation to the school situation and contacts with friends in school

interest orientations: interest in outdoor activities, verbally oriented activities, technical activities, domestic activities, socially oriented activities and office related activities.

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3 The follow-up data was directed to three partly overlapping sub-samples based on different criterias. The questionnaires were sent to a total of about 8,200 respondents with a response rate of 76%.

From the respondents' time as 32 years old, i.e. in 1980, the following groups of variables are used:

Work-related variables: a set of 10 measures of different aspects in work are used, six of them describing actual conditions in the work situation and four describing desired work conditions

Competence and ability variables (self-rated): verbal ability (Swedish language), ability in English, everyday practical skills (practical, mechanical and domestic matters) and two measures of civic competence (help-seeking and assertive)

Social life and relations variables: time spent with relatives, friends and one's own family and neighbors, contacts with persons with different professional competence from whom the respondents could seek help or support in relation to different aspects of caring, technical or practical matters.
(The variables are described in closer detail in Table 2.)

Subjects

Selection and definition of the three professional groups were made on the basis of the information from the respondents about their professional status in the 1980 questionnaire. The groups focused in this study are nurses, lower primary teachers (hereafter referred to as teachers) and secretaries.[4] The sample includes only women and resulted in the distribution presented in Table 1 below.

Table 1: Number of women in the groups

Nurses	160
Teachers	106
Secretaries	207
Total	473

[4] The nurse category includes 12 midwives.

Statistical methods

The main statistical method used in this study is multiple discriminant analysis.[5] This is employed here in order to find out to what extent it is possible to discriminate between these three professional groups on the basis of different individual factors. The analysis shows on one hand how well the variables taken together manage to separate between the groups and predict group membership, on the other it indicates the discriminatory power of each of the variables included, i.e., the variables relative influence in separating between the groups.

Preliminary a set of principal component analyses has been performed in order to reduce the original number of variables (when possible) and thus facilitate further analysis and interpretation. The components are then used as predictors in the discriminant analyses and thereby replaces the original variables.[6,7]

As a general rule the variables are analysed within their respective time-periods, that is, belonging to when the women were 13 years old and when they were 32 years old, respectively. A stepwise[8] discriminant analysis is performed for each of the two time-periods based on the total number of variables in each period. Within each of these two time-periods the variables are grouped according to which area of interest they belong to (school, leisure activities, work conditions and so on). Each of these different subgroups of variables has been analysed separately using direct discriminant analyses, in order to evaluate the impact of the respective group of variables.

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5 The principle of the method can be described as comparing mean structures between in advance specified groups given a set of variables. The variables are ordered and weighted in a set of uncorrelated linear combinations (discriminant functions) which provide maximum separation between the groups, i.e., maximizes between to within association.

6 The factor score is a standardized value where the individual value (in this case the group mean) signifies the deviation from the total mean (mean=0, SD=1).

7 The components or factors in the tables are written with capital letters.

8 The stepwise procedure means that only variables that significantly contribute to the discrimination are included in the function.

Table 2: Variables used in the analyses

Information from 1961 (13 years old)

Background

***Home background** This classification index ranging from 1 to 5 is based on father's occupation and level of education where 5 indicates the highest level of occupation/education. ***Mother's education** Values 1 to 4 where 4 indicates academic level and 1 indicates six years of elementary school. ***Mothers at home/ working** This is coded as a dichotomous variable where 1=working and 0=staying at home. ***Number of siblings** Interval variable where 1 indicates one sibling and so on. ***Position among children** Indicating if the women were the first=1, second=2 and so on, child in the family.

School

***GENERAL**
***NUM/VERB**
Principal components based on results on three different ability tests (verbal comprehension, spatial visualization, inductive reasoning) and marks in Swedish, Mathematics and English. The first component **GENERAL** has high loadings on all of the variables and indicates a general ability. The second component **NUM/VERB** is bipolar where numerical ability stands in contrast to verbal ability.

***EDAMB**
***ADAPT**
***SOCIAL**
Components based on 7 questions pertaining to pupil's interest, ambition and adaptation to school, plans for further education, perceived parental support for further education, contacts with parents and with classmates. **EDAMB** refers to educational ambition and parental support. **ADAPT** refers to adapting to the situation in school, interest in studying and contact with parents. **SOCIAL** refers to contacts with classmates.

Interest orientations

***Outdoor**
***Verbal**
***Technical**
***Domestic**
***Social**
***Office**
These orientations are summed indices based on the respondents priorities between different kinds of activities. They range from 10 to 30 indicating low up to high degree of interest in the respective orientations.

Table 2: Continued

Information from 1980 (32 years old)

Work - actual and desired conditions

***Decide WHEN**
***ROUTINE**
***Decide HOW**
***CAREEROPP**
***Decide WHO**
***SAFEEMP**

These work related components resulted from a principal component analysis including altogether eighteen items in the questionnaire. Ten items concerned actual work conditions and eight items degree of influence in one's work. **WHEN** - influence over different time related aspects (work-hours, vacation, coffee-breaks). **ROUTINE** - work tasks clearly defined and the same, in contrast to new learning in work. **HOW** - influence over choice and performance of work tasks. **CAREEROPP** - perceived possibilities to higher income and higher degree of influence in work. **WHO** - influence over who to work with. **SAFEEMP** - not having to worry about losing one's job.

***IMP-CAREER**
***IMP-ROUTINE**
***IMP-TEAM**
***IMP-SAFEEMP**

These four components are based on the ten items relating to work conditions, the same as used above, but where the respondents rated the importance of the different aspects. **IMP-CAREER** - important with career opportunities. **IMP-ROUTINE** - important with routine oriented work tasks. **IMP-TEAM** - important working together with others and having a work that is physically flexible. **IMP-SAFEEMP** - important not having to worry about losing one's job.

Personal competence and abilities (self-rated)

***LANGSWED**
***LANGENGL**

These two principal components were based on altogether twelve questions about perceived capability in reading, writing, speaking and listening comprehension in Swedish and English. Eight items related to Swedish and four to English. The first component **LANGSWED** summarizes the perceived ability in Swedish and the second **LANGENGL** the ability in English.

Table 2: Continued

***PRACTICAL**
***MECHANIC**
***DOMESTIC**
These three components resulted from an analysis performed on questions relating to the respondents' ratings of their capabilities handling everyday practical skills. **PRACTICAL** refers to activities like mending clothes, taking care of clothes, painting, carpeting, needlework and knitting. **MECHANIC** refers to taking care of a car and repairing easier mechanical objects. **DOMESTIC** refers to daily household activities like cooking, cleaning, taking care of flowers and garden.

***Civ-help**
***Civ-complain**
These are two summed indices based on altogether twelve questions relating to different aspects of civic competence. The questions concerned the respondents' perceived resources in knowing where to get help or make complaints about different matters relating to public authorities. **Civ-help** refers to help-seeking items e.g. "seeking legal advice or seeking unemployment compensation". **Civ-complain** refers to assertive items e.g. "making appeal against termination of a lease of an apartment".

Social life and relations

***RELATIVES**
***FRIENDS**
***FAMILY/NEIGHBORS**
These three components are based on six questions relating to how much time the respondents spend with family, friends etc.

***HOUSE**
***CARS**
***ILLNESS**
***HAIR/CLOTHES**
These components refer to ten questions about having friends or contacts with different professional competence whom the respondents can ask for help if needed. **HOUSE** relates to help with different kinds of constructions and installation work in houses. **CARS** relates to help buying or repairing cars. **ILLNESS** relates to help when ill or having personal problems. **HAIR/CLOTHES** relates to help with hair-do and dressmaking.

Data Analysis

The main question posed in this study is to what extent it is possible to distinguish between women in these three traditional female professions. The longitudinality of the data using information from and about the women collected with twenty years in between, makes it possible to shed some light over some basic questions within the research of professions. To what degree are individuals shaped by or influenced by their professional belonging and to what degree are the same individuals determinants for the development of the profession?

Main differences at thirteen

Sixteen variables from 1961 were employed in a stepwise discriminant analysis where seven variables contributed significantly to discriminate between the groups. Mean values for the significant variables is shown in table 3.[9,10] A summary of the results from the discriminant analysis is shown in table 4.

The seven variables that add significantly to the discrimination are home background, mother's educational level, the two school success variables, educational ambition and also two of the interest orientations; office related and verbal activities.

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9 In appendix 1 means and standard deviations in all variables used from 1961 are displayed for the three groups as well as the pooled within-groups correlation matrix.

10 The display of the variables in the tables follow the order in which the variables were included in the function. The principles of inclusion are based on the correlation between the independent variables and the dependent variable (here, occupational group) beginning with the variable showing the maximum correlation.

Table 3: Means for variables included in the discriminant-function. Information collected 1961 when respondents were thirteen years old

Variables	Nurses (n=133)	Teachers (n=86)	Secretaries (n=172)	Total[11] (n=391)
GENERAL	-.23	.51	.00	.03
Verbal related interest	19.99	20.35	20.94	20.49
Office related interest	18.44	17.90	19.13	18.62
EDAMB	-.15	.35	-.05	.00
NUM/VERB*	.03	.17	-.11	.00
Mother's education	1.29	1.28	1.17	1.24
Home background	2.36	2.67	2.29	2.40

* a positive value indicates numerical ability and a negative value verbal ability

Table 4: Stepwise discriminant analysis. Information 1961[12]

	Functions			
Variables	F1 Stand coeff	F2 Stand coeff		
GENERAL	.70	.35		
Verbal related interest	-.21	.67		
Office related interest	-.26	.55		
EDAMB	.32	.00		
NUM/VERB	.28	-.18		
Mother's education	-.17	-.39		
Home background	.29	.01		
			Percent correct classified	
Canonical			Nurses	46,6
correlation	.319	.227	Teachers	64,0
Wilks lambda	.85	.95	Secretaries	42,4
	p=.000	p=.002	Total	48,6

11 SPSS Discriminant excludes cases which have at least one missing value of some of the variables. Missing values for the variables included in this study appear to be evenly distributed across both cases and variables and are therefore excluded from the analysis.

12 The stepwise discriminant analysis resulted in two significant functions (F1 and F2). The number of possible functions in the analyses equals the number of groups minus one (or, if smaller, the number of predictors). In this study the number of possible functions will always be two because there are three groups (and a larger number of predictors in each analysis).

Both discriminant functions separate significantly between the three groups. However, they show a relatively weak degree of association, around or less than .30, indicating a moderately low power in predicting group membership. Altogether the functions manage to classify almost half the women (49%) in the correct professional group, where teachers are the group with the highest possibility to be correctly identified.

The first function separates teachers against the two other groups as shown in Table 5 displaying mean values for each group in the functions. Looking at the relative influence[13] for the seven variables the general ability in school is the main influence separating teachers from the other two groups. Educational ambition, numerical/verbal ability and home background follow but with considerably less relative influence in the function.

Table 5: Group mean value in the discriminant functions

Group	Function 1	Function 2
Nurses	-.21	-.29
Teachers	.63	-.03
Secretaries	-.15	.24

As can be seen in Table 3 displaying the means, teachers are on the average scoring considerably higher in the general ability component compared to the other two groups; secretaries and specially so nurses. Teachers also tend to score better on numerical ability, where secretaries tend to go in the other direction with higher average verbal ability. Teachers come from higher education/occupational level families and are also the group with highest educational ambition (which includes parental support towards higher studies).

13 The standardized coefficients displayed in Table 4 (and Table 7) provide information about the relative importance of a variable in the discriminant function, i.e., which variables that contribute most to the discrimination between the groups in the function.

The second function is separating secretaries from nurses with teachers in between. The two most important predictors are the two interest orientations, where secretaries as a group deviate significantly from the other two groups in being more orientated towards verbal as well as office related activities. The two other variables of relatively more influence in the function, general ability in school and mother's educational level, indicate that secretaries are managing better in school (compared to nurses) and that they, to a higher degree, have mothers with less education.

Impact from the respective variable groups

In order to establish the discriminatory power of each group of variables in separating between the three groups of professional women, three separate analyses were conducted employing a direct discriminant analysis on each of the group of variables; background, school and interest orientations. To what degree is it possible, for instance, to predict the girls' occupational status when only considering factors related to their family background?

The analyses showed that when testing the discriminatory power only taking into consideration the influence from the variables which describe the women's background, they proved not to be able to significantly predict group membership.[14] Looking at each variable's relative influence in the first function (which is close to significant with p=.06) the same variables as in the total analysis are of more importance, meaning mother's educational level (stand. coeff: .55) and the girls' home background (stand. coeff: .40). In addition, one variable not included in the total stepwise analysis was of relatively more importance here, i.e., if the mother was working outside the home (stand. coeff: .39).[15] The differences between the three groups of women concerning this predictor follow the differences found concerning the mother's educational level, indicating that secretaries have mothers that to a higher degree stayed at home (and with less education).

The other two groups of variables, school and interest orientations, both proved to be able, "in their own power", to discriminate between the three groups significantly on the first function, i.e., in

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14 Canonical correlation (F1): .167 p=.06 (F2): .104 p=.30

15 The two remaining variables, number of siblings and position as child in the family were of less importance (stand. coeff <.20).

one dimension. Looking at the strength of the functions in the respective variable groups, the school related variables appear to be somewhat stronger related to the individuals' scores in the function and thus more predictive.[16] When looking at the relative influence from the variables in the respective functions the result pattern does not deviate compared to the pattern in the total analysis, i. e., the same variables are of relatively more importance when looking at the variable groups separately.

Relating to school, the most important predictor is the general school ability (stand. coeff: .75) followed by educational ambition (stand. coeff: .39) and the bipolar predictor (NUM/VERB) measuring verbal versus numerical ability (stand. coeff: .30). The remaining two predictors relating to the girls' adaptation to the school and their social contacts in school were of less importance judging from the standardized coefficients (<.20).

Relating to interest orientations among the girls, the same two interests, office related activities (stand. coeff: .75) and verbal related activities (stand. coeff: .64) are of relatively more influence as compared to the total analysis. The remaining three interest orientations all show coefficients around .20 or less.

In conclusion it can be said that the pattern related to the relative importance of the variables show, at large, consistency in relation to the result from the performed total analysis based on the variables from 1961, i.e., from when the women were girls at thirteen.

Similarities at thirteen

Having focused on the differences between the three groups of women and taking into consideration the information from their early teenage time in life, it is also interesting to look somewhat into what variables that did not (significantly) differentiate between the groups.

Considering the home background variables for these women, the information related to number of siblings in the family and to whether the women were first, second etc. child in the family were of no influence in separating these groups. Neither did the two

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16 Canonical correlation: School (F1): .300 p=.00 (F2): .102 p=.37
Canonical correlation: Interest (F1): .234 p=.00 (F2): .113 p=.36

school related factors, adapting to the situation in school and having social contact with classmates, to any significant degree separate the women.

Looking at the interest orientations, the girls are equally less interested in technical matters (total mean=15,25) and equally more interested in outdoor activities (total mean=23,22) and somewhere in the middle when it comes to domestic activities (total mean=21,16) or to an interest oriented towards social activities (total mean=21,23).

Main differences at thirty-two

Having seen that it is possible, at least to some degree, to distinguish between women working in these three professions as early as in their teenage period, the next step in this study is to clarify to what extent the same is possible when they are young adults. For this analysis a total of 24 predictors were included in a stepwise discriminant analysis where 12 of these variables proved to be significantly contributing to discriminate between the groups. The variables included in the discriminant functions are displayed in table 6 below showing their mean values in the groups.[17,18] The summary results from the discriminant analysis are displayed in table 7.

The twelve variables are all predictors related to actual work conditions, two of the desired work conditions predictors, three predictors related to personal competence and abilities and finally one predictor related to the respondents' social life and relations.

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17 In appendix 2 means and standard deviations in all variables used from 1980 are displayed for the three groups as well as the pooled within-groups correlation matrix.

18 See Note 10.

Table 6: Means for variables in the discriminant function. Information collected 1980 when respondents were thirty-two years old

Variables	Nurses (n=118)	Teachers (n=78)	Secretaries (n=170)	Total[19] (n=366)
Decide WHEN	-.44	-.75	.76	.03
ROUTINE	-.13	-.53	.32	.02
Decide HOW	-.20	.55	-.14	.00
CAREEROPP	.36	-.48	.03	.02
SAFEEMP	.31	-.57	.02	-.02
LANG-ENGL	-.42	.09	.36	.05
IMP-CAREER	-.08	-.55	.25	-.04
IMP-TEAM	.54	.31	-.46	.03
Decide WHO	.06	-.25	.13	.02
Civ-help	13.84	13.27	13.14	13.39
Civ-complain	11.89	11.94	12.16	12.02
ILLNESS	.26	.00	-.17	.00

All except two of the predictors relating to actual and desired work conditions are included in the functions and also exert relatively strong influence in the functions judging by the standardized coefficients.[20] Looking at the means of these variables they also indicate quite substantial differences between the groups. Of relatively more importance among the variables are also the perceived competence in the English language and the two factors measuring self-rated civic competence. Of considerable less influence in the functions but contributing significantly to discriminate between the three groups, is finally included the variable measuring a type of social strength, estimated in the questionnaire as having friends with professional competence to contact in case of illness.

19 See Note 11.

20 The two work predictors not included are IMP-ROUTINE and IMP-SAFEEMP.

Table 7: Stepwise discriminant analysis. Information 1980[21]

	Functions			
	F1	F2		
Variables	Stand coeff	Stand coeff		
Decide WHEN	.92	.04		
ROUTINE	.60	.13		
Decide HOW	-.45	-.38		
CAREEROPP	.19	.56		
SAFEEMP	.28	.48		
LANG-ENGL	.12	-.40		
IMP-CAREER	.34	-.10		
IMP-TEAM	-.13	.36		
Decide WHO	.26	.12		
Civ-help	-.05	.35		
Civ-complain	.14	-.28		
ILLNESS	-.12	.17		
			Percent correct classified	
Canonical correlation	.821	.579	Nurses	78,0
Wilks lambda	.22	.66	Teachers	91,0
	p=.000	p=.000	Secretaries	86,5
			Total	84,7

All taken together these variables have strong predictive power in discriminating between the groups of women working as nurses, teachers and secretaries. The canonical correlations (.821 and .579) in the two significant functions show a relatively strong degree of association between the individual scores in the functions and their group belongings. This indicates that the groups are quite different with respect to these variables from when they were young adults. A concrete measure with regard to the discriminatory power is the "hit-rate", i.e., how many of the cases that can be classified in the correct group, which on the basis of these variables is a total of 85%.

The first function polarizes between teachers at the negative pole and secretaries at the positive pole in the dimension as can be seen in Table 8.

21 See Note 12.

The variable of main importance in the first function is influence over the work situation related to time aspects in work (Decide WHEN). The two other variables with relatively more influence in the function is routine orientated work and (in contrast) to be able to exert an influence in planning and deciding how to work. To decide who you work with and to value career possibilities in the work are also of some influence in this function.

Teachers are characterizing their work situation as having little possibility to decide over different time aspects in their work, such as work hours, vacation etc. (mean=-.75) whereas secretaries have larger influence (mean=.76) over these aspects in the work. Secretaries also have more influence when it comes to who to work with or for (mean=.13) compared to teachers (mean=-.25). Instead teachers have large influence of deciding how to do their work (mean=.55) compared to nurses (mean=-.20) and secretaries (mean=-.14) with little influence in this aspect. Secretaries also describe their work situation as consisting of routine type task (mean=.32), again in contrast to mainly teachers (mean=-.53).

One of the predictors concerning how these women value different aspects in the work situation is of some importance in the function. Secretaries find it more important (mean=.25) that their work gives possibilities in relation to career aspects, more influence and higher income, than do teachers (mean=-.55).

Table 8: Group mean value in the discriminant functions

Group	Function 1	Function 2
Nurses	-.58	1.00
Teachers	-2.07	-.79
Secretaries	1.45	-.30

The second function mainly polarizes between nurses at the positive end and teachers at the negative end of the dimension. Secretaries are on the same side in this dimension as teachers but not so strong, i.e., closer to the total mean value.

The strongest predictors in this second function are that the work is characterized by offering possibilities to career development and the predictor to feel safe in the employment, i.e., not having to worry about losing one's job. One predictor relating to desired work aspects is also of relatively more importance in this function; valuing a work that means working together with other people, teamwork, as well as having a work that is physically flexible.

Nurses perceive their work situation as offering them possibilities in terms of career development (mean=.36) which is not in line with the teacher perception of these aspects in their work (mean=-.48). Nurses also feel (in 1980) that they don't have to worry about loosing their job (mean=.31), again in contrast to teachers who don't share this feeling of security in their job situation (mean=-.57). Especially nurses (mean=.54), but also teachers (mean=.31), value to work together with others in a team and to have a work which is physically flexible, contrasting the opinions of the secretaries (mean=-.46) who don't consider this to be important qualities in the work.

Of additional importance in discriminating between the groups are also the predictor variables measuring self-rated ability in the English language and the two civic indices.

Nurses rate their knowledge of English lower (mean=-.42) than the other two groups, especially secretaries (mean=.36). Looking at the women's knowledge when it comes to seeking help or making complaints regarding matters relating to public authorities, nurses are more confident in help seeking matters (mean=.13,84) than the other two groups (teachers 13,27 and secretaries 13,14). Secretaries seem to be somewhat more confident in relation to making complaints to authorities (mean=12,16) than nurses (mean=11,89) but also teachers (mean=11,94).

The predictor Decide WHEN used in this analysis, is somewhat different from the other work predictors, in that it is so closely related to the special circumstances in the organisation of work as a teacher. Obviously teachers can't very well say that they have any influence related to these time aspects, for instance to choose their hours of work or when to take a holiday. For this reason this aspect of work is more or less bound to be discriminating between teachers and the other two groups merely reflecting the work organization. Because of this an additional analysis was conducted based on the same set of

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predictors except for the predictor Decide WHEN which was excluded from the analysis.

This analysis resulted in much the same overall pattern as with the complete set of predictors as presented above. The total "hit-rate" went down to 76%, a drop with nine per cent which indicates this predictors importance, but where the predictive power in the functions still are quite strong. Looking at the canonical correlation in the first function this is now somewhat less convincing, (.684 compared to .821) but still moderately strong. (In the second function the correlation did not change.) The analysis included the same 11 variables as in the complete analysis but with the addition of one more variable, IMP-ROUTINE, also included in the functions, showing, however, a moderate influence.[22] Looking at the pattern concerning the relative influence from the predictors, it also show a high degree of correspondence with the complete analysis above. With some exception of an increased weight in the predictor IMP-TEAM the same predictors were of importance relatively seen.

Impact from the respective variable groups

The groups of variables were also analysed in three separate analyses in order to establish their discriminatory power when no other information is used. The variables related to work proved to be highly significant in discriminating between the women as could be expected from their proven influence in the total stepwise analysis. Both functions are significant and as strongly correlated[23] with the group identities as the analysis based on the total set of variables. Almost identically the same variable pattern is also displayed when comparing the relative influence from the variables. The two work related variables not included in the total analysis above proved to be of little influence (with standardized coefficients less than .20) also here in the direct analysis.

Examining the variables related to personal competence and abilities they also manage to discriminate between the groups significantly in their own power while the variable group relating to the women's social life and relations is not significantly powerful in separating between the groups.[24] The weak predictive power of the

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22 F1 stand. coeff: .29 F2 stand. coeff: .05

23 Canonical correlation: Work (F1): .810 p=.00 (F2): .509 p=.00

24 Canonical correlation: Personal competence and abilities (F1): .428 p=.00 (F2): .115 p=.44. Canonical correlation: Social contact and relations (F1): .189 p=.14 (F2): .102 p=.62

last mentioned variable group when operating by themselves, is in correspondence with the results from the total analysis where only one of these variables was included, and proved to be of little relative importance.

Looking at the competence set of variables the same variables that fell out in the total stepwise analysis proved to be (judging by their standardised weights) of more importance also in this analysis. In addition, one variable not included in the total analysis (MECHANIC), was here of relatively more importance (stand. coeff: .39) in the significant first function. Nurses are the group rating their abilities somewhat higher (mean=.16) in comparison with secretaries (mean=-.16) and also teachers (mean=.04) when taking care of easier task related to technical, mechanical matters.

Compared with the total analysis some predictors here show higher loadings in the function. The self-rated competence in the English language, when compared in this set of variables, is considerably more influential (stand. coeff: .80). Also the civic competence variable referring to help-seeking in different societal matters, loads higher here (stand. coeff: .53) than in the total analysis.

In conclusion it can be said that these three separate analyses, on the whole, confirm the results from the stepwise analysis; the strong predictive power of the work related variables, the more moderate influence from the competence variables and the low degree of differences when it comes to the women's social life pattern.

Similarities at thirty-two

Half of the predictors used in the analysis concerning the respondents' adult time, did not contribute significantly to discriminate between these groups of women.

As we have seen, almost all of the predictors related to work aspects differed considerably between these groups of women. In only two aspects of work did the women not differ, in the value aspects having a safe employment and having routine type tasks in the work.

The areas where the women are found to be more similar than different in this analysis are mainly related to their descriptions of

their social life and relations and also to how they rate their adult competence and abilities.

No significant differences were found in relation to how these women rate their competence in daily practical activities, such as cooking, cleaning, taking care of clothes, flower and garden. No differences of importance were found in how they rate their verbal abilities (referring to aspects in the Swedish language) or relating to the degree to which they meet and associate with family, relatives, and friends. Finally, the women to a similar degree have contacts with people professionally competent within the areas house construction, installation work, buying or repairing cars. This also refers to having friends with knowledge in how to cut hair or make clothes.

Concluding comments

The results from the two performed stepwise discriminant analyses show that it is possible to distinguish significantly between the three groups of women on the basis of the information used here, related to the time when the women were 13 years old as well as when they had reached the age of 32.

The discriminant power proved to be considerably stronger when considering the data from 1980, i.e., when the women were young adults. The most important adult variables were those related to work - both perceptions of the actual work situation and desired qualities of work. Eight of ten women were classified belonging to the correct professional group.

Although not as powerfully discriminating between the groups, the set of variables from the women's adolescence could significantly separate them. About half were classified in the correct professional status, which may be thought of as quite impressive, considering the fact that the women at the time only were thirteen years old. The most important predictor was the general ability in school, but also, related to school, the numerical-verbal ability as well as the educational ambition, were influential. Two of the interest orientations, verbal-, and office orientated activities, were strong predictors. Also of some importance was the home background and the level of the mother's education.

Looking at the results it is quite clear that teachers show the most distinctive profile in this context.[25]

Teachers, as young girls at thirteen, came from a family background with somewhat higher education/occupational level, were clever at school and had higher educational ambitions (including perceived support from their parents) and were also in general well-adapted to the school situation.

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25 It may be worth pointing out, that when performing analyses of this kind, comparing mean averages between (in this case, professional) groups, the results pertain only to the groups and information used. Putting, for instance, teachers in another context, can change the picture completely. Each group's average on the variables are compared in relation to the total group mean, i.e., the average value based on information from the total sample included, in this study; nurses, teachers and secretaries.

Teachers, as young adults at thirty-two, on one hand have no or little influence over "when" aspects in their work (when to work, have holiday, take a break etc.), but, on the other hand, they have what could be characterized as an autonomous work, with a lot of influence on how to perform or to carry out one's work tasks (planning, conducting etc.). They describe their work as being varying and inducing new knowledge, but not as offering any possibilities in terms of career (more influence, higher income). They have no influence over who to work with, or no feeling of safety in their employment, i.e., keeping the job. The two aspects, career possibilities and security, which the teachers perceive as lacking in their work situation, they, at the same time, do not feel as being important qualities in the work.

Secretaries, as young girls at thirteen, came from families with somewhat lower capital in terms of education and occupational level, where the mother also to some degree was less educated. They demonstrated an average general ability balancing over to the verbal ability for which they also showed more interest in terms of their ratings of verbal orientated activities higher compared to the other groups. Finally, they showed considerably more interest, than the other groups, in activities related to office.

Working in offices at the time when they were thirty two, they describe a work situation consisting of a large influence in deciding when to work and some influence related to who they work with. At the same time, they have a work that is perceived as being routine orientated, to a large degree with tasks clearly specified and similar which also relates to having little influence over how to plan or conduct the work. They value it as important to have possibilities to get more influence and higher income which they, however, do not perceive their work as offering. Concerning their adult capabilities, secretaries rate themselves to have good capabilities in the English language and also knowledge (compared to the others) when it comes to complaining to authorities regarding different matters.

Nurses, as thirteen years olds, did not in this context do very well in school judging from their average general ability, which also goes together with a lower degree of educational ambition. At thirty-two, working as nurses, they describe their work situation as being in large parts decided not by themselves; regulated hours of work, low degree of influence on how to do one's work. However, they

perceive their work as offering good career possibilities (which they do think of as an important quality of work) and also good security in terms of not having to worry about losing the job. They value to work together with others which includes having a physically flexible job (which is also an accurate description of the job as a nurse, at least in most cases). They rate themselves to have more knowledge in different kind of help-seeking situations in society as well as (naturally enough) contacts with people with medical knowledge.

What then is the common trait in these three profiles? Well, one obvious common trait is that the profiles mostly relate (depending, of course, on the variables included) to the women's work places, giving a description of the organization and the character of the work. All three of these professional groups can be said to be types of service work, where the tasks are being conducted directly as a kind of service to a person or persons. In the case of the nurses there are the patients at one end and the doctors at the other end to assist. The secretaries working in an office serving a (presumable in most cases male) boss at some level. The teacher is working alone in the actual work situation but depending on the regulations in the school system in general, and, of course, serving the children with their teaching. In relation to this more factual description of the work situation, it is interesting to put the women's values in relation to this. One of those aspects is finding or not finding it important to have possibilities to make a career. Teachers and nurses do not value this as being an important aspect in the work, while secretaries do value this aspect as an important one. This difference is of course hard to know the origin of, it could be an actual reflection of being satisfied with the wages or not, a difference in type of involvement or engagement in the work, or again, it could indicate different living circumstances in general, to mention some possible reasons.[26]

Looking at the time period when the respondents were thirteen years old, it is interesting to see that there appears to be some pattern already at this time. The teachers are the ones well-adapted to school and showing the best results and later in their life also returning to school but now on the other side of the teacher's desk.

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[26] These types of answers are not possible to get within the frame of this study. The study is also of exploratory character meant to generate questions and hypotheses rather than giving the answers.

Secretaries show an interest already at that time in activities related to offices and also with an interest in verbal activities as well as an ability for it. Being secretaries as adults they also rate their knowledge in the English language as good. Nurses are the group which do not in this context appear very clearly. It could have been, for instance, hypothesized that they would show greater interest in social activities compared to the other groups, which they did not.

In this study there are several limiting aspects to take into consideration. One is that when using data for reanalyses posing different questions than it was initially designed to measure, some information will necessarily be lacking. Here, one such piece of lacking information is that we do not know the actual work place for the respondents. This means for this study that we can only presume that nurses and teachers work in the public sector, at hospitals and schools. Even if that can be a relatively safe assumption there still exists a great variation of, for instance, what kind of work situation you can have as a nurse. As for the secretary group they could vary between being a state employee and (probably quite frequently) being employed within the private market. Put somewhat more generally, we lack insight into what the respondents' terms of references are when answering the questions in the questionnaire.

One other aspect to consider is the limitation in regard to the time when the data were collected. This obviously more or less has effect on the responses. It will be one of the continuations of the present study, to investigate more closely the relations on the labour market and other macro-related aspects. The study concerns one specific age cohort, born 1948, which has to be considered when thinking of the results presented here. These kind of limitations can, on the other hand, be seen as advantages relating to the fact that the variation to some part is controlled for, which means that the differences we find between these groups of women are not related to time or age-factors, for instance. This study has attempted to control for variation further by only including women and only women working in typically female oriented types of professions. Given this reduction of plausible sources of variation, it is interesting that it is still, to so such relatively high degree, possible to distinguish between these groups of women, underlining the necessity of not treating women as one group but instead taking into consideration and investigating the differences among women.

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Means and standard deviations for observed variables from 1961

Variables	Nurses Mean (S.D)	Teachers Mean (S.D)	Secretaries Mean (S.D)	Total Mean (S.D.)
Mother home/work	.31 (.46)	.28 (.45)	.22 (.42)	.26 (.44)
Mother educ	1.29 (.66)	1.28 (.66)	1.17 (.43)	1.24 (.57)
Position child	1.85 (1.12)	2.01 (1.49)	1.79 (1.01)	1.86 (1.17)
No. of siblings	2.66 (1.40)	2.70 (1.53)	2.50 (1.37)	2.60 (1.41)
Home background	2.36 (1.37)	2.67 (1.30)	2.29 (1.40)	2.40 (1.37)
GENERAL	-.23 (.99)	.51 (.83)	.00 (.96)	.03 (.98)
NUM/VERB	.03 (1.02)	.16 (1.01)	-.11 (.93)	.00 (.98)
EDAMB	-.15 (1.00)	.35 (.95)	-.05 (.96)	.00 (.99)
ADAPT	.02 (1.00)	.11 (.88)	-.01 (1.04)	.02 (.99)
SOCIAL	-.01 (1.02)	.02 (1.03)	-.01 (.99)	.00 (1.01)
Outdoor	23.38 (3.40)	23.31 (2.98)	23.06 (3.17)	23.22 (3.20)
Verbal	19.99 (2.77)	20.35 (3.07)	20.94 (2.84)	20.49 (2.89)
Technical	15.23 (2.97)	15.46 (3.19)	15.16 (2.77)	15.25 (2.93)
Domestic	21.63 (3.78)	21.23 (3.39)	20.76 (3.36)	21.16 (3.53)
Social	21.24 (3.20)	21.76 (2.96)	20.95 (2.91)	21.23 (3.03)
Office	18.44 (3.20)	17.90 (3.28)	19.13 (3.50)	18.62 (3.38)

Pooled within-groups correlation matrix for observed variables from 1961 2 (2)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Mother home/work	1.00															
2. Mother educ	.17	1.00														
3. Position child	-.12	-.02	1.00													
4. No. of siblings	-.14	.07	.75	1.00												
5. Home background	.11	.46	.02	.04	1.00											
6. GENERAL	.05	.06	-.06	-.02	.08	1.00										
7. NUM/VERB	-.01	-.05	.06	.07	-.16	-.02	1.00									
8. EDAMB	.00	.24	.04	.03	.25	.35	-.05	1.00								
9. ADAPT	.07	.01	-.11	-.06	-.03	-.09	-.06	-.04	1.00							
10. SOCIAL	.04	-.10	-.05	-.01	-.01	.13	-.05	.01	.01	1.00						
11. Outdoor	.02	.09	.03	-.02	.00	.05	.02	.10	.05	.09	1.00					
12. Verbal	-.05	.02	-.01	-.02	.07	.12	-.23	.23	-.03	-.03	-.12	1.00				
13. Technical	.00	.03	-.04	-.05	.06	.08	.07	.04	-.06	-.07	-.02	-.04	1.00			
14. Domestic	.06	-.03	.01	.07	-.06	-.16	.13	-.17	.05	-.10	-.38	-.27	-.30	1.00		
15. Social	-.02	.06	.05	.03	.07	.05	-.09	-.01	.04	.10	-.12	-.23	-.29	-.10	1.00	
16. Office	-.03	-.16	-.04	-.01	-.12	-.10	.05	-.15	-.08	.01	-.31	-.22	-.24	-.11	-.20	1.00

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Appendix 2
1 (3)

Means and standard deviations for observed variables from 1961

Variables	Nurses Mean (S.D)	Teachers Mean (S.D)	Secretaries Mean (S.D)	Total Mean (S.D.)
Decide WHEN	-.44 (.89)	-.75 (.66)	.76 (.73)	.03 (1.02)
ROUTINE	-.13 (.92)	-.53 (.80)	.32 (.98)	.02 (.98)
Decide HOW	-.20 (1.03)	.55 (.75)	-.14 (.96)	.00 (.98)
CAREEROPP	.36 (1.02)	-.48 (.80)	.03 (1.00)	.02 (1.00)
Decide WHO	.06 (1.00)	-.25 (.72)	.13 (1.17)	.02 (1.04)
SAFEEMP	.31 (.83)	-.57 (.99)	.02 (1.06)	-.02 (1.02)
IMP-CAREER	-.08 (.96)	-.55 (.88)	.25 (.97)	-.04 (.99)
IMP-ROUTINE	-.03 (.96)	.01 (1.05)	.02 (1.04)	.00 (1.02)
IMP-TEAM	.54 (.73)	.31 (.99)	-.46 (.93)	.03 (1.00)
IMP-SAFEEMP	-.04 (1.12)	-.09 (.96)	.12 (.86)	.02 (.97)
LANGSWED	-.02 (.88)	.05 (.91)	.04 (1.07)	.02 (.98)
LANGENGL	-.42 (.95)	.09 (.88)	.36 (.99)	.05 (1.00)
PRACTICAL	-.04 (.97)	.11 (.91)	.06 (1.10)	.04 (1.02)
MECHANIC	.16 (.99)	.04 (.92)	-.16 (.96)	-.01 (.97)
DOMESTIC	.01 (.97)	-.12 (.99)	.00 (1.06)	-.02 (1.02)
Civ-help	13.84 (1.21)	13.27 (1.40)	13.14 (1.50)	13.39 (1.42)
Civ-complain	11.89 (1.66)	11.94 (1.56)	12.16 (1.68)	12.02 (1.64)
RELATIVES	-.09 (1.07)	-.02 (.93)	.02 (1.03)	-.03 (1.02)
FRIENDS	.12 (1.05)	.06 (.85)	-.08 (1.13)	.01 (1.05)
FAMILY	.06 (1.06)	.19 (.84)	-.04 (.95)	.05 (.96)
HOUSE	.02 (.99)	-.09 (1.00)	.02 (1.00)	.00 (1.00)
CARS	-.02 (1.04)	.00 (.99)	-.05 (1.02)	-.03 (1.02)
ILLNESS	.26 (.79)	-.01 (1.00)	-.17 (1.08)	.00 (.99)
HAIR/CLOTHES	.11 (1.01)	.03 (.99)	-.02 (1.07)	.03 (1.03)

Pooled within-groups correlation matrix for observed variables from 1980 2 (3)

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. Decide WHEN	1.00											
2. ROUTINE	.29	1.00										
3. Decide HOW	.19	-.06	1.00									
4. CAREEROPP	-.09	.05	.08	1.00								
5. Decide WHO	-.10	.01	.04	-.05	1.00							
6. SAFEEMP	-.04	.08	.07	-.12	-.06	1.00						
7. IMP-CAREER	-.15	.02	.01	.29	-.01	.02	1.00					
8. IMP-ROUTINE	.20	.34	.12	.03	.01	.01	.05	1.00				
9. IMP-TEAM	-.33	.02	-.06	.06	.15	.01	.17	.09	1.00			
10. IMP-SAFEEMP	.04	-.05	-.11	-.06	.03	.19	-.01	.00	.00	1.00		
11. LANGSWED	.04	.05	.08	.00	.08	.06	.09	.24	.08	.00	1.00	
12. LANGENGL	-.01	-.03	.00	.05	.03	-.12	.08	.01	.05	.04	-.03	1.00
13. PRACTICAL	.11	-.13	.11	-.08	-.01	.06	-.17	-.08	-.13	.03	.14	-.01
14. MECHANIC	.00	.00	.10	.04	.10	-.01	.01	.08	.07	-.08	.14	.12
15. DOMESTIC	-.07	.03	.06	.09	.03	.12	.12	.08	.07	.11	.32	.03
16. Civ-help	-.11	-.03	.01	.06	.05	-.03	.06	.00	.06	-.07	.28	.03
17. Civ-complain	-.10	.06	.06	.13	.06	.07	.11	.09	.06	-.04	.26	.08
18. RELATIVES	-.03	-.09	.00	.04	.01	.03	.00	-.08	-.06	-.02	.06	-.03
19. FRIENDS	-.04	.06	.01	.05	.03	.07	.09	.16	.16	-.07	.12	.06
20. FAMILY	-.06	.17	.03	.02	-.04	.00	-.04	.11	-.01	-.05	.02	-.11
21. HOUSE	.03	-.01	.09	.10	-.02	-.08	.03	.00	.03	-.01	-.03	-.01
22. CARS	.06	.04	.05	.01	.07	.00	.05	.02	-.04	-.01	.08	-.01
23. ILLNESS	.09	.02	-.03	.04	.12	.09	.10	.10	.04	-.09	.15	.04
24. HAIR/CLOTHES	-.10	-.03	.02	.11	.04	-.03	.07	.02	.08	.00	-.01	-.05

Variables	13	14	15	16	17	18	19	20	21	22	23	24
13. PRACTICAL	1.00											
14. MECHANIC	.03	1.00										
15. DOMESTIC	-.05	.05	1.00									
16. Civ-help	.04	.15	.14	1.00								
17. Civ-complain	.08	.20	.12	.37	1.00							
18. RELATIVES	.05	.08	.09	.05	.10	1.00						
19. FRIENDS	.02	.01	.04	.04	.04	-.01	1.00					
20. FAMILY	.01	-.02	-.02	.01	.08	-.03	.02	1.00				
21. HOUSE	.17	.08	-.02	.04	.07	.12	-.01	.13	1.00			
22. CARS	.11	-.01	.03	.07	.08	.05	.07	.00	.04	1.00		
23. ILLNESS	-.06	.16	-.06	.09	.21	.01	.19	-.06	.01	-.02	1.00	
24. HAIR/CLOTHES	-.15	-.12	-.02	.06	.03	.10	.17	.08	-.01	.01	-.05	1.00

Professional Profiles -

A Longitudinal Analysis of Three Traditional Female Professions

The present study analyzes the extent to which it is possible to distinguish professional profiles when comparing women working as secretaries, lower primary teachers and nurses (n=473).

The results are based on data from a national longitudinal database, which comprises a representative sample of individuals born in 1948 and covers a time-span of about twenty years dating from 1961 to 1981/82. The main statistical method used is multiple discriminant analysis employed in two separate analyses, dividing the data-set between information collected when the respondents were thirteen (1961) and when they were thirty-two (1980), respectively. The report presents main differences between the three professional groups at the respective time period and discusses the impact of the information used in separating between the groups of women.

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